

Comparison of Cytological Categories (C1-C5) of Fine Needle Aspiration Cytology among Various Sizes of Palpable Breast Lesions

SADIA YASEEN¹, MOMINA JAHANGIR², BURHAN-UL-HAQ³, AHSAN MASUD CHAUDHRY⁴

¹Medical Officer, Department of Histopathology, Shaikh Zayed Hospital, Lahore

²Medical Officer, Doctors Hospital, Lahore

³Consultant Surgeon, Govt Said Mitha Teaching Hospital, Lahore

⁴Assistant Professor of Surgery, Fatima Memorial College of Medicine & Dentistry, Lahore

Correspondence to: Dr. Sadia Yaseen Email: sadiaali651@gmail.com Cell 0304-4865739

ABSTRACT

Objective: To find the association of fine needle aspiration cytological categories (C1-C5) with palpable size of breast lesion.

Study Design: Cross-sectional comparative study

Place and Duration of Study: Histopathology Department, Federal Postgraduate Medical Institute, Shaikh Zayed Hospital, FPGMI Lahore from 25th February 2016 to 24th August 2016.

Methodology: One hundred and twenty patients coming in surgical OPD and indoor of SZH who were advised FNAC breast were selected. After performing FNAC, the results were reported according to the cytological category from C1-C5.

Results: Sixteen (13.33%) were categorized as C1, 63 (52.50%) C2, 2 (1.67%) C3, 7 (5.83%) C4 and 32 (26.67%) C5. There was a significant ($P < 0.0001$) relationship between various sizes of the breast lesion and the cytological category of fine needle aspiration.

Conclusion: Palpable breast masses can definitely be diagnosed by a blend of physical examination and diagnostic workup including FNAC and there is a strong correlation between different sizes of palpable breast lesions and cytological categories of FNAC breast as small lesions resulted benign and malignant lesions have larger size.

Key words: Cytological categories, Palpable breast lesions

INTRODUCTION

Breast cancer is one of the most commonly prevalent cancers in women in all countries of the world.¹ Phenotypically, these breast cancers are composed of diverse morphology of breast tumor cells.² This is second governing cause of mortality by cancer. Clinically most common presentations are discharge from nipple, either unilateral or bilateral lump in breast.

Palpable breast lesions can be benign or malignant cystic and firm lump. Either benign or malignant their prognosis is different it develops fear of early mortality and unease in patient as well as in the family members.³ Breast cancer is also most frequently encountered cancer among Pakistani females.⁴

Among all risk factors of breast cancer, Pakistani women escape the reproductive risk factor as early marriage; multiple child births and breast feeding are practiced as a norm.⁵

Aspiration cytology is established diagnostic tool in different populations worldwide. Although Histopathology diagnosis is gold standard for diagnosis of palpable lesions of breast, fine needle aspiration is gaining popularity for diagnosis of breast lump.^{6,7}

Fine needle aspiration (FNA) can be confidently used for diagnostic confirmation of an operable advanced-stage breast cancer before systemic therapy. Sentinel node biopsy can be avoided if axillary lymph node is positive in FNAC.⁸ For breast lesions that appear benign or probably benign on radiological imaging, FNA is preferred as gold standard sampling technique. For cystic lesions that are benign, FNA is sufficient not only to obtain diagnostic tissue but also sometime prove to be therapeutic.

Extra mammary neoplasms metastatic to breast are very rare and almost present with same symptom as primary neoplasm of breast. These neoplasms include malignant melanoma, lymphoma, lung carcinoma and carcinoma of small and large gut. In case of metastatic tumors of extra mammary origin, FNA suffices diagnostic method.

FNA can be used as the sole sampling technique as the first line of diagnostic tool for pathological evaluation. This test has great confidence level in presence of two or more clinical factors like size and mobility of breast mass, definite decision related to management can be taken without a need of histological confirmation by excision biopsy.

Triple diagnostic test comprising of breast examination by physician, mammography and fine needle aspiration cytology should be encouraged especially in developing countries.⁹

In our set up in hospitals where there are budget limitations and personnel shortage there is a dire need to reveal significant cost effectiveness in diagnosis of breast lesions.

National Health Service (NHS) breast screening program in United Kingdom has recommended a grading system as cytological categories (C1-C5) of FNAC.¹⁰ The diagnostic categories used in FNAC of palpable breast lesions are C1, C2, C3, C4, and C5 according to national cancer institute guidelines 1996.^{11,12}

The dire need of this study was to have a deeper insight to predict the diagnosis of palpable breast lesions by following international standardized protocol with the help of cytological categories of FNAC in accordance to size of palpable breast lesions. In this way, the degree of

differentiation of the breast lesions could be predicted with respect to the size of lesion. The literature about this type of study is scarce in Pakistan. This study was aimed to compare cytological categories of FNAC with palpable breast lesion. The study will help clinician to offer best treatment modality to patient judiciously.

MATERIALS AND METHODS

It was a cross sectional comparative study done at Department of Histopathology, Shaikh Zayed Hospital, Lahore from February 25, 2016 to August 24, 2016. A total of 120 patients were selected who present with palpable mass. The surgical examination was performed which include palpation of consistency of lesion and tumor size in length. The tumor size was measured by measuring tape and was into four groups; group A 1cm, group B 1.1-2 cm, group C 2.1-5 cm and group D >5 cm. A total of 120 patients, who were advised FNAC breast were selected. The results of FNAC were reported according to the diagnostic category from C1-C5 as recommended by NHS Breast screening program. Females of age 18-60 years with palpable breast lesion were the inclusion criteria. Females with already established diagnosis of breast cancer and pre-puberty age group, non consenting patients and Frank mass with skin infiltration were the exclusion criteria. Apparatus for FNAC were: Syringes of 10 cc (disposable) with needles gauge between 22-25 depending on the consistency of lesion during examination. Slides, which were clean and name of patient was labelled on slide with glass pencil, Fixatives 95% Alcohol. All slides were stained with H&E, Giemsa and papanicolao stain.

Before performing the procedure, clinical examination of the breast lump was conducted in all cases in order to feel the consistency and extent of the lesion, so that aspirate could be taken from exact lesion, not from breast parenchyma or fat. Patient was counselled about the procedure and procedure was done with her consent. Lump was held among thumb and index finger of left hand. The skin over the site of FNAC was cleaned by methylated spirit. For palpable masses, needle was passed two to four times for successful aspirate. Needle was inserted in lesion after examination and suction was applied needle was moved to and fro in order to obtain enough aspirate. The

suction was released when the blood or material is seen in the needle hub. Smear was made by expressing small drop of aspirated material onto each slide. After preparation of direct smear, they were routinely processed for cytology examination including staining with H & E, air dried Giemsa and papanicolau stains. Pressure was applied over the skin to avoid complication (bleeding, hematoma).The prepared slides were examined under the microscope. The results of FNAC were reported according to the diagnostic category from C1-C5 as recommended by NHS Breast screening program. Data were entered and analyzed by using SPSS-22. Comparison of cytological categories was made for any lesion size groups by using chi-square test. P-value ≤ 0.05 will be considered significant.

RESULTS

In this study, 120 patients with palpable breast lesion were included. Among these patients, 31(25.80%) were between 18-30 age group, while 42(35.00%), 47(39.20%) were between 31-45 and 46-60 age groups respectively. Mean age of the patients were 39.96±12.23 with 18 and 60 as minimum and maximum ages. Sixteen 13.33%) were categorized as C1, 63(52.50%) C2, 2(1.67%) C3, 7(5.83%) C4 and 32(26.67%) C5. Among the adequate aspirates maximum number 63 (52.5%) from masses of mean size 1.5 cm were categorized as C2. Aspirates graded as C3 (1.67%), C4 (5.83%) and C5 (26.67%) were aspirated from masses with palpable size 1.5 cm. 2.5 cm. and 3.5 cm, respectively. All groups have equal number of palpable breast lesions i.e. 30 (25%). There was a significant (P<0.0001) relationship between the size of the lesion and cytological category of FNAC, as shown in our study where category C2 and C5 were mostly from masses 2–5 cm, or more in size. Among these patients, 61 (50.8%) had breast lesion for less than one year, while 44 (36.7%), 14 (11.7%), 1 (0.8%) had breast lesion for less than two years, less than three years and more than three years respectively. All patients had lumps 120 (100.0%), while 2 (1.7%) had the complication of nipple discharge. 115 (95.8%) had unilateral breast lesion, while 5 (4.2%) had bilateral lesion. 21 (17.5%) had the consistency of lesion as cystic, while 99(82.5%) had the consistency of lesion as solid (Table 1).

Table 1: Comparison between the size of the lesion and cytological categories of FNAC

Groups	Cytological categories					Total	P value
	C1	C2	C3	C4	C5		
A (1 cm)	7 (23.3%)	18 (60%)	1 (3.3%)	2 (6.7%)	2 (6.7%)	30 (100%)	0.0001
B (1.1-2 cm)	3 (10%)	23 (76.7%)	-	1 (3.3%)	3 (10%)	30 (100%)	
C (2.1-5 cm)	1 (3.3%)	17 (56.7%)	1 (3.3%)	1 (3.3%)	10 (33.3%)	30 (100%)	
D (>5 cm)	5 (16.7%)	5 (16.7%)	-	3 (10%)	17 (56.7%)	30 (100%)	
Total	16 (13.3%)	63 (52.5%)	2 (1.7%)	7 (5.8%)	32 (26.7%)	120 (100%)	

DISCUSSION

Fine needle aspiration of the breast is a rapid, relatively less traumatic and accurate method for the diagnosis of breast disease.¹³ The real challenge for FNA cytologist is in their ability to translate cytological patterns into histological

ones that have diagnostic meaning.¹⁴ Early diagnosis of cancer is crucial, a delay in the diagnosis of breast cancer is unfortunately common because of economic and social reasons in our society, with a poor impact on the management of such patients, it is therefore, important that

a reliable cost-effective and easy to perform investigation like FNAC should be done in such circumstances.¹⁵

A definite diagnosis sometimes cannot be made by FNAC either due to inherent limitations of cytological examination or by inability to obtain adequate material for diagnosis. The rate of sampling error and inadequacy for lesion <1 cm can be attributed to deep location of the lesions.

In this study, 16 out of 120 (13.3%) were categorized as inadequate, due mostly to deep location of the lesion or due to fault in the technique a finding consistent with a study conducted on aspirates where 15.1% aspirates were found to be inadequate, especially in suspicious collagenous lesions and in specimens submitted by inexperienced sampling procedures.¹⁶ Another study also reported 114 out of 507 (22.5%) aspirates as inadequate.¹⁷

A comparison of palpation size of the breast lesions in adequate and inadequate specimens of our study showed a significant ($P < 0.000$) difference in the mean palpation size of the lesions 0.5cm vs. 2.5 cm, indicating that cytological diagnoses must be correlated with clinical findings to reduce the rate of false negative cases.

Our findings are in contrast to a study conducted in the University of Texas cancer Center where no significant difference was found on comparison between adequate and inadequate palpation size of the breast lesion (0.8 vs. 2.9).¹⁸ The mean palpable size of breast lesions in our study was found to be 3.5 cm (range 0.5–7cm) which was comparable to a study including 213 patients having 3.7 cm (range 1–10 cm) mean tumour size.¹⁹

Majority of the masses aspirated in my study 23 (76.7%) were 1.1–2cm in size and categorized as C2 followed by 17 (56.7%) 2.1–5cm, and 17 (56.7%) >5 cm in size. The aspirates categorized as C4 and C5 were 39 (32.5%) and were 2–5 cm in size, majority (75%) In a study, aspirates of C2 category 63 (52.5%) they were comparable with a study where 26 (52%) specimens were categorized as C2.¹⁵

A definite diagnosis of malignancy in this study was made in 32 (26.7%) aspirates, whereas 7 (5.8%) were found to be suspicious of malignancy, these findings were in contrast to a study conducted on 382 aspirates, with 98 (25.6%) diagnosed to be malignant and only 4 (1%) were found to be suspicious for malignancy.²⁰ The present study, showed similar results to another study categorizing 20 out of 231 (9%) aspirates as suspicious.²¹ False positive diagnosis may result from atypical epithelial proliferation, fibroadenoma and inflammatory lesions, as indicated in the present study.

It was also observed in our study that with increasing size of the tumour, the surety of picking up the malignant lesion in higher cytological grades also increased. It was found that FNA was able to correctly diagnose malignant lesions in 194 out of 289 (67%) aspirates as compared to our study where 32 (26.7%) malignant and 7 (5.8%) suspicious were identified, thus avoiding delays in cancer surgery due to multiple biopsies.²²

CONCLUSION

Palpable breast masses can definitely be diagnosed by a blend of physical examination and diagnostic workup including FNAC which when performed by a dedicated and

skilled cytopathologist ought to be a vital part of a breast screening service. Results of this study clinicopathological findings and statistical analysis augments that there is a strong correlation between different sizes of palpable breast lesions and cytological categories of FNAC breast as small sized lesions prove to be benign most likely and malignant lesions have larger size. Inadequacy of this technique most likely appears in small sized lesions usually. So the C1–C5 categorizing system for aspiration cytology is practical and gives noteworthy opportunity of freedom of expression / assessment to cytopathologist and effectively understandable for the clinician.

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